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concentration by this biological assay.

The relation between median knock down time and dilution is gien by the following equation,

$Y=2.155+0.755\ (X-3.753)$,

where Y is median knock down time in logarithms and X is dilution in logarithms (between 1/1000 and 1/32000 dilution).

The toxicity of tetraethyl pyrophosphate of 1/1000 dilution (original solution) declines to about 1/2.262, 1/6.886 and 1/32.627 after 12, 24 and 48 hours respectively, at 15°C, declines to 1/4.705 and 1/27.316, after 12 and 24 hours, at 25°C. and declines to 1/12.762 after 12 hours at 35°C. As the time advances and the hydrolysis progresses, the toxicity of the original solution almost diminishes after 72, 48 and 24 hours respectively at 15, 25 and 35°C.

The curve representing between the degree of hydrolysis in logarithmic scale and the time elapsed can be interpreted as a single straight line. Comparing this fact with the chemical analysis on the hydrolysis of tetraethyl pyrophosphate by H. Coates[1] and S.H. Hall and Martin Jacabson, there is a considerable coincidence between the two.

綜　　說

JAPANESE PYRETHRUM FLOWER AND ITS INSPECTION SYSTEM

S. HIRAI (The Institute of Insect Control, Kyoto University, Takatsuki)

12. 日本の除虫菊並にその検定制度

平 位 省 三

(1) Outline of Japanese Pyrethrum flower.

I will try to describe in this note the condition of Japanese Pyrethrum flowers since 1941. Until 1940, Japan was the principal supplier of Pyrethrum flowers to U. S. A., but her Exportation to the market abroad ceased in 1941 owing to last World War. Production in Japan had remained at a high level since 1935 until 1942 (the second year of last war), with approximately over 10.000 tons annually, but since 1943 the production dropped to almost half of the above quantity owing to bad food situation, inspite of a great assistance and support from the Army authorities. After the war, dropping of production continued until 1949, and at last it came down to about 1,200 tons in 1949. That is to say, the production of Japanese flowers dropped to about one tenth of average yield since 1935 to 1942. However on account of a favorable turn of food situation, the production has begun to increase since 1950, and about 250 tons of the Japanese flowers were exported from the port of Kobe for the first time after the war. Last year(1951) about 1,500 tons of the flowers were produced and about 500 tons were exported mainly tor Argentine. Production of this year is expected to be about 2.300 tons.

The principal producing districts are Hokkaido and western Japan (Kansai) including Prefectures of Hiroshima, Okayama, Wakayama, Kagawa, and Ehime. Average production in Hokkaido has been almost equal to the total production of western Japan in these years. As average yield of dried flowers per acre in western Japan is about 900 lbs, while it is 350 lbs or less in Hokkaido, the total production of the former is increasing remarkably year after year. Especially the maximum amount per acre in Hiroshima is twice as much as the average yield of western Japan. The average pyrethrin content of New Crop Flowers is about 1% by Seil acid method, detailed list of which are given in the last pages of this note.

As a new trend of Japanese Pyrethrum, for example, Hokkai No.1 and Wattsamu No.403 show higher content of Pyrethrins, i. e. from 1.5-1.7%. This fact leads us to believe in a great improvement of the Japanese Flower in its value in the near future.

(2) Consumption of Pyrethrum in Japan.

During last war Pyrethrum flowers were used mostly for military and agricultural purposes and pyrethrum for civilian uses almost ceased.

But at present the Pyrethrum is consumed mainly for civilian uses. Pyerthrum insecticides for agricultural use have been manufactured only in a small quantity because of the high cost of the Flowers when compared to DDT, BHC and other synthetic insecticides. Pyrethrum insecticides in Japan can be divided into the following usage:

I. For agricultural use

commercial name	Pyrethrin content
a. Pyrethrum powder	0.8% up.
b. Pyrethrum emulsion concentrate	1.5 1.5% up.
c. Pyrethrum emulsion concentrate	3.0 3.0% up.

II. For household use

a. Anti mosquito incense coils 0.5%

Pyrethrum powder	60-70%
paste powder	20-30%
Exhausted Pyrethrnm powder or Saw dust	about 10%
malachite green	0.3%

b. Mosquito larvicide concentrate 180m. g. in 100c.c.

c. Pyrethrum household spray 160m. g. in 100 c.c.

Perhaps more than 50% of the total Pyrethrum production were being used for manufacturing anti mosquito incense coils last ycar.

(3) The grades of Japanese flowers.

After the harvest of dried flowers they are packed in gunny bags which hold 61.1 lbs each. Flowers are classified as 1st, 2nd and 3rd grades by local official graders according to the set standards at each producing district.

These classifications are based on the color, maturity and general appearance of the flowers. After the classification a label showing 1st, 2nd or 3rd is attached outside of the gunny bag.

1st grade: Well dried flowers of good color
More than 70% mature flowers
Less than 15% discolored flowers
Free from foreign matters.

2nd grade: Dry flowers of good color
More than 60% mature flowers
Less than 30% discolored flowers
Free from foreign matters.

3rd grade: More than 50% mature flowers
Less than 35% discolored flowers
Moisture content: less than 13%
Free from foreign matters.

At present the Pyrethrum Flowers for export are mixtures of these grades. As production of Japanse flowers increase, special classification for export at producing districts is expected.

(4) Inspection of Pyrethrum for Export.

I will show here excerpts of Japanese official Gazette (August 26.1950).

A Part of ministries of welfare, agriculture, & Forestry and International Trade & Industry Notification No. 1 June 1950. shall be amended as follows and shall come into force from Oct. 1. 1950. Dried Pyrethrum flower:

Grades are classified into upper grade and lower one, with their standard as follow:

Description	Upper grade (F. A. Q.)	Lower grade (L.G.)
Dryness	By the gravitational method, water content is less than 13%.	not falling under upper grade.
Content of Pyrethrins	In the condition of less than 13% of water content by means of gravitational method, to be over 0.9% in use of the modified Seil acid method.	ditto.
Color	good.	ditto.
Impurity	Not to contain stalks, leave and others.	ditto.
Quality	To be good in quality with no musty and no fermentive odor.	ditto.

Although both grades of the above may come under the Upper Grade classification, one shall be classed as the lower grade when it is specifically recognized as inferior for so-

me other reasons. Based on the above notification for export products, Export commodities Inspection office, Ministry of agriculture & Forestry inspects the Pyrethrum for export at the export centers, mainly at Kobe. But this inspection is performed at random instead of all flowers for export and consequently the office does not issue any certificates of inspection.

Therefore we, members of the Institute of Insect control, Kyoto University have begun to make analyses and issue certificates of analyses for shipments of the Pyrethrum since 1950 by the request of Exporters.

Representive samples are collected by members of our Institute by following method and ratio. Five samples of about one pound each per ton of 2240 lbs of Pyrethrum flowers are picked up at random. These are mixed together and reduced to the quantity of some 2½ lbs by means of quartering method. Part of them is analysed and the rest is preserved by this Institute.

Analyses of such representative samples are made in accordance with Japanese official method (J. O. method). The method is Seil acid method modified by this Institute (J. agr. chem. Soc. Japan. 16. 389. 1940). As far as the Pyrethrum flowers concerned, average results by this method are almost epual to those by other methods. Analyses of Pyrethrum by Japanese official method Comparing those of other methods.

	J. O. methol	A.O,A,C method	analyst
1. Japanese Pyrethrum powder	0.876	0.898	Sumita
2. Belgian Conge flower A	1.18	1.20	〃
B	1.58	1.53	〃
3. Japanse flower(1947)		Copper Reduction	Wakazono
4. Hiroshima A	1.15	1.13	〃
B	0.75	0.77	〃
5. Okayama	1.24	1.22	Wakazono
6. Ehime	1.31	1.31	〃
7. Kagawa	1.07	1.05	〃
8. Hokkaido	1.06	1.06	〃

Our Institute may apply some other method of analyses also by request.

(5) Analyses of 1951 crop Japanese Pyrethrum one to three months after harvesting (J. O. method).

Province and locality		grade	Pyrethins content
Hokkaido	Nohnai	1	1.07
〃	Hifu	1	1.14
〃	Hifu	2	1.13
〃	Kenbuchi	2	1.07
〃	Kenbuchi	3	1.03
〃	Wattsamu	2	1.08
〃	Wattsamu	3	1.04
〃	Shibetsu	2	1.06
〃	Furano	2	1.23
〃	Furano	3	1.06
〃	Reigo	3	1.08
〃	Aibetsu	3	1.06
〃	Tsurunuma	2	1.10
〃	Ozawa	3	0.99
〃	Sokuhatsu	3	0.99
〃	Meda	3	1.07
Hokkaido	Shinko	2	1.17
〃	Biei	2	1.24
〃	Nayoro	3	1.11
〃	Kimobetsu	3	1.07
〃	Kamifurano	3	1.10
〃	Nakafurano	2	1.02
〃	Furen	2	1.07
〃	Reigo	2	1.13
〃	Ashibetsu	3	1.11
〃	Yoichi	3	1.21
〃	Hokuto	2	1.09
Hokkaido	Average		1.08
Okayama	Kanaura	2	0.89
〃	Kananra	3	1.01
〃	Kanaura out of grade		0.82
〃	Hata	1	0.96
〃	Kitakishima	1	0.99
〃	Kitakishima	2	1.07
〃	Kitakishima	3	1.12
〃	Tamashima	3	1.03
〃	Nagao	3	1.09
〃	Kamogata	3	0.92
〃	Ibara	2	1.01

〃	Yorishima	3	1.01
〃	Oda	3	0.99
〃	Suyama	2	0.95
〃	Kohnoshima	3	0.98
〃	Konko	2	1.06
〃	Manabeshima	3	1.12
Okayama average			1.02
Kagawa	Takamishima	1	1.12
〃	Takamishima	2	1.10
〃	Sayanagi	1	1.18
〃	Shonai	3	1.02
〃	Koteshima	1	1.13
〃	Nio out of grade		0.96
〃	Yoshima	1	0.94
Kagawa average			1.05
Hiroshima	Sansho	1	1.20
〃	Shigei	1	1.12
〃	Shigei	2	1.00
〃	Shigei	3	0.96
〃	Sagiura	2	0.99
〃	Minamiiguchi	2	1.08
〃	Mukohshima	2	1.07
〃	Tachibana	2	1.03
〃	Ohama	2	0.88
〃	Myoga	3	0.86
〃	Setoda	3	0.95
〃	Sagiura	3	0.98
〃	Higashino	3	0.85
Hiroshima average			0.97
Ehime	Yuge	1	1.03
〃	Yuge	2	1.05
〃	Yuge	3	0.91
〃	Moriguchi	1	0.93
〃	Hakuboh	2	0.95
〃	Hakuboh	3	1.07
〃	Iwagi	2	0.91
〃	Kagami	3	0.87
Ehime average			0.96

Above chemical analyses were made by S. Hirai, S. Sumita and M. Nakagawa at this Institute.

我国除虫菊事情とその検定制度

平位省三（財団法人防虫科学研究所除虫菊部会）

1940年まで我国は米国に対し主要なる防虫菊輸出国であつたが第二次大戦の爲除虫菊の輸出は1941年に止つた。1942年まで年額平均一万屯以上の乾花が生産され世界第一の産額を維持したのだが1943年食糧事情悪化の爲半減しその後産額は減少を続け1949年には遂に約1200屯まで落ちた，然し戦後五年目に食糧事情，肥料事情も漸く明るくなつたので增産に転化し1950年戦後初めて250屯の乾花が神戸より輸出された，本年(1952年) は2300屯の生産が期待されてゐる。乾花の品質に就ては昨年神戸より輸出されし乾花約500屯の6割以上はピレトリン含量1%以上であつた。日本に於ける除虫菊の消費は現在農薬としてよりも家庭殺虫剤特に蚊取線香に最も多量消費されてゐる。乾花の等級は肉眼鑑定により生産地に於て実施されてゐるがピレトリン含量とは必ずしも一致してゐない。輸出規格は農林省輸出品検査所に於て示され同所が随時輸出地に於て昨年より検査してゐる。然し同所は原則として乾花の有効成分の保証証明を発行しないので財団法人防虫科学研究所は高槻市京大化学研究所に於て業者の依頼により除虫菊乾花，エキス及除虫菊製品の品質検定及輸出乾花の輸出検定を実施してゐる。昨年輸出されし乾花の生産地別分析成績を別記英文の最後の表に示した。

A Fourth Digest and List of Publications of Benzene Hexachloride. Masayuki HAMADA, *Botyu-Kagaku* **17**, 64(1952)

13. BHC 文 献 の 抄 録 IV*

浜 田 昌 之

第 III 集に引続いて BHC の主として化学に関係のある文献を抄録して第 IV 集とする。こゝに掲げる文献は1951年末迄に著者が原報文又は抄録を入手し得たものについて集録した。化学関係（構造，性質，合成，定量等）は入手し得た全文献を掲げそのうち目ぼしいものを抄録し，生物関係(殺虫力，毒性，薬害等)については主要な文献のみを挙げることゝした。**

構造，性質：BHC 関係物質の構造に関しては大岩

* BHC 文献の抄録. I.：防虫科学 **11**, 24–59 (1949).
同 上. II.：同誌 **13**, 62–64 (1949).
同 上. III.：同誌 **15**, 118–121 (1951)

** 本文献集 (I-IV) に脱落している文献を御存じの御方は恐縮ですが著者宛御一報あらば幸甚と存じます。